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ABSTRACT

This publication provides an overview of some of the current themes relevant to school building design. It looks at the relationship between school buildings, attainment, and behavior and describes projects that address ways in which school buildings can support and encourage participatory learning, and enhance both Great Britain's national curriculum and individual schools' curricula. It examines the implications of opening up school buildings to the wider community and the role of the physical environment in the inclusion of children with special educational needs and disabilities. Finally, factors that will have implications for school buildings in the future such as environmental concerns and the impact of multimedia technology are addressed. (Contains 91 references.) (EV)

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Building Education

The role of the physical environment in enhancing teaching and research

Helen Clark

EF 006 164

INSTITUTE OF EDUCATION
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UNIVERSITY OF LONDON

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1 Introduction

Good infrastructure is truly at the base of a quality education. For a society searching for ways to address the educational needs of the future, the building itself is a good start.
(Berner, 1993)

This publication provides an overview of some of the current themes relevant to school building design. It looks at the relationship between school buildings, attainment and behaviour and describes projects that address ways in which school buildings can support and encourage participatory learning, and enhance both the National Curriculum and individual schools' curricula. It examines the implications of opening up school buildings to the wider community and the role of the physical environment in the inclusion of children with special educational needs and disabilities. Finally, factors that will have implications for school buildings in the future such as environmental concerns and the impact of multi-media technology are addressed.

The publication is an update of an earlier internal literature review into research on school buildings carried out in 1999 for the **Makeover at School Project** based at SENJIT (Special Education Needs Joint Initiative for Training), Institute of Education. Since that time, interest in school buildings has been steadily gaining momentum. More architects have become involved in school design over the last five years as the result of increased government funding and changes in the way in which monies are distributed. There have been several conferences concerned with aspects of the educational built environment. Publicity for the growing number of projects and organisations that are addressing issues of school design in innovative ways is increasing. The contrast in the level of interest in the area and the lack of information currently available is evident in the frequent requests for literature and resources the Makeover at School Project receives.

SCOPE

Building Education will provide a springboard for other research, practical projects and initiatives. It is not a manual for practitioners. Guidance and policy issues are discussed in broad terms with the intention that readers further investigate areas pertinent to their particular needs or interests. A list of useful organisations is included (p. 34).

The focus is on mainstream primary and secondary schools in England. Unless specified, it can be taken that discussions are equally applicable to both. By virtue of the literature available, examples provided have a slight bias towards secondary provision. Early years and tertiary provision are unfortunately beyond the scope of this paper, although some of the themes discussed may be of relevance.

Any organisation named in the text in **bold** has its contact details listed in Chapter 8.

2 Context

Getting the basics right is not just about literacy and numeracy – it also means putting the right facilities in place so that teachers can teach and children can learn.
(David Blunkett, Secretary of State for Education and Employment, January 2001)

The positive impact of changing the environment of a school has often been overlooked. School buildings have been seen only as places where school is 'kept', and have only recently been considered as places that can directly support or inhibit learning. Some research (e.g. Rutter *et al.* 1979, National Commission on Education, 1996) has shown that effective teaching and learning can take place in spite of adverse physical conditions and lack of resources. Evidence of this can, of course, be seen in many schools. The report by the National Commission on Education examined how 11 inner-city schools were improving the education of their pupils. It concluded: 'It might be speculated that in some schools the physical environment may not be a necessary condition of effective learning ... [however] a key component in the strategy for improvement has been the close attention paid to the physical environment' (National Commission on Education, 1996).

INNOVATIONS AND PROGRESS

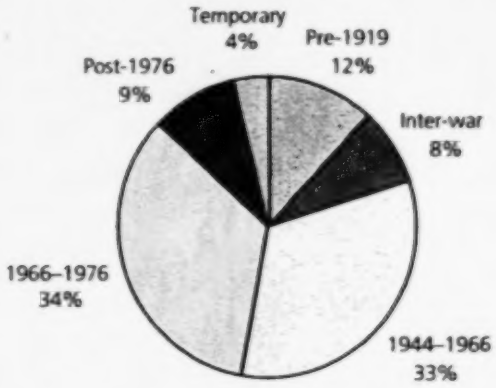
There have been some success stories in school building since the 1980s, in particular some innovatively designed primary schools, such as the pioneering work of Hampshire architects in the 1980s and 1990s (e.g. Woodlea Primary School) and more recent innovative design projects for Essex schools (e.g. Notley Green Primary School, designed by Allford Hall Monaghan Morris Architects). The successful lobbying of the Disability Movement has ensured statutory recognition of the need for access to public buildings and this has impacted on policy for educational buildings. The work of **Learning through Landscapes** on utilising school grounds as a learning resource has made a considerable impact in the last decade.

Notley Green County Primary School
Designed by Allford Hall Monaghan Morris Architects after winning a competition held by Essex County Council and the **Design Council**, Notley Green County Primary school is an example of a sustainable project. Costing the same as a traditional school to build, it features green materials and methods and is much more fuel-efficient than conventional school buildings. The school's roof is covered in soil and planted with sedum, making it both well insulated and an ideal micro-climate for insects and birds. Sustainable cedar wood is used as cladding, bamboo for the floor and recycled newspapers as insulation material. The front entrance floor is covered in matting made from recycled lorry tyres.

INSUFFICIENT INVESTMENT

Generally, the issue of deteriorating school infrastructure has been consistently pushed down the educational agenda. A 'prolonged period of what has generally been acknowledged to be insufficient investment in the sector's capital stock' (DfEE, 2000) has meant that school buildings are ageing rapidly; only around 10 per cent of the stock has been built in the last 25 years. Between 1950 and 1970 over 7,000 new schools were built, the equivalent of almost one a day. The majority of these school buildings are now at or past the end of the 30–40-year life span envisaged when they were built. The OFSTED 1999–2000 Annual Report states that over a quarter of secondary schools inspected had 'inadequate accommodation adversely affecting the quality of teaching.' The status quo of poor quality school environments has become so general as to be acceptable; in particular, expectations of inadequate and unpleasant secondary school buildings have become normalised.

Figure 1: School building in England and Wales



LACK OF EDUCATIONAL RESEARCH

It is almost axiomatic that the physical environment of a school is important as a factor in each child's learning; but solid proof or support of the proposition especially in terms of assessing the amount of difference the environment makes is almost non-existent.

(Weinstein, 1979)

The neglect of school buildings in the past quarter of a century corresponds with a lack of educational research into their use. Investigation into the physical environment as a variable influencing learning outcomes has been largely ignored in favour of research into pedagogical, psychological and social variables. The last time there was much literature on the physical environment of the school was during the post war 'golden age' of school building and in the context of debates centred around the open plan movement. Discussion concerning education over the past 25 years has tended to ignore the fact that schools are physical entities as well as organisational units (Weinstein, 1984). This 'absence of concern' on behalf of educational research (Jamieson *et al.*, 2000) about the relationship between physical place and teaching and learning has contributed to the neglect of school buildings.

The sheer number of hours that children spend in school each day should in itself prompt investigation into the impact of the physical environment (Windsor, 1996). The minimal attention received by school buildings is in contrast to that given to other public buildings. There has been research into the effects on behaviour of non-school environments such as prisons and hospitals (e.g. Cavanagh, 2000; Horne, 1998). Business has invested in and capitalised on studies that have demonstrated the link between an improved environment and greater employee satisfaction and increased productivity (Berner, 1993). The wealth of

television programmes, retail outlets and magazines dedicated to home improvement testify to the importance we attach to our home environment and our well being.

CAPITAL SPEND AND PLANNING

With a lack of guidance in the form of research-based evidence, and with little capital to spend on even rudimentary repair and maintenance work, effective management of the school environment may have been a low priority for school managers. In the past, the way in which funds for school buildings have been made available encourages schools to take the 'least cost' option for short term gain. Decision making has been further divided by the separation of capital and maintenance budgets. The funding framework for the construction and maintenance of buildings has undergone some reorganisation in the last ten years, with schools becoming increasingly active partners in a devolved decision making process.

Funding and planning context

Introduced in April 1999, the Fair Funding plan requires that funding for building repairs and maintenance should be delegated wholly to schools. Funding for more substantial 'capitalised repairs' such as roof replacements are available in the form of Formula Capital and Seed Challenge Capital under the New Deal for Schools.

These new funding plans ensure that schools and Local Authorities have a firm indication of capital allocations over three years rather than one year enabling them to plan investment in their buildings 'confidently and with foresight.'

The introduction of Asset Management Plans (AMPs) was designed to provide an agreed basis for local decisions on spending priorities and to help individual schools develop plans by making decisions on funding priorities across an authority 'fair and transparent'. The main aims and objectives of the AMP are to set out the information needed and the criteria used to make decisions about spending on school premises to enable better targeting of capital investment through generating systematic audits of the condition, sufficiency and suitability of every school building. This information can feed into a Buildings Development Plan (BDP) which schools are required to prepare as part of their School Development Plan (SDP). This strategy provides a long term strategic review of the school premises which aims to decrease the need for reactive, short-term responses to repair and maintenance.

Moves towards financial self-governance may be seen as desirable by school managers, but they inevitably lead to an increase in an already heavy workload. Thinking about design may be a luxury for head teachers when coping with the immediate and competing demands of increasing numbers of high-profile initiatives. As Hayhow notes, 'it can be difficult to convince others of the importance of getting surroundings right when there seem to be more important educational matters in need of attention. There may be resistance to spending time (and money) on what appear to be trivialities' (Hayhow, 1995). The dilemma of 'whether to designate funds for teachers and teaching materials or for buses and buildings' (Earthman and Lemasters, 1998) has tended to be resolved in favour of spending on resources that have an easily quantifiable impact on learning rather than on those that appear to have no direct relationship with student performance and behaviour.

CHANGES IN PERCEPTION

In 2001, however, a *Guardian* article asserted 'there is now growing consensus that a school's built environment is central, not peripheral to behaviour and performance in the classroom'. The present government appears to have recognised the importance of the quality of the environment in raising standards. For the first time in decades substantial

capital is being allocated to school buildings. The Labour administration made £7.8 billion available for school buildings under the New Deal for Schools programme during its first term (DfEE, January 2001).

In addition to an increase in capital spending on school buildings, other government initiatives have direct implications for the physical environment of the school. The introduction of Local Education Authority Asset Management Plans (AMPs) recognises the need for a long term, holistic approach to managing the built environment; moves towards delegated funding allow head teachers more control over capital spending; the **Schools Access Initiative** provides some funding to increase accessibility for all learners and the **National Healthy Schools Standard** initiative recognises the importance of a healthy and safe working environment. The current drive towards lifelong learning including increased early years provision and a revised 16–18 curriculum will change the way in which school buildings are used and increase the community use of school facilities. The emphasis on social inclusion and the introduction of new technologies will also have major implications for school buildings. Changes in pedagogy too, require a variety of flexible spaces for varying group sizes as there is a move towards a more problem-based, project-orientated curriculum.

3 School buildings, behaviour and attainment

Improving the quality of school buildings is essential if we are to succeed in raising achievement.

(David Blunkett, Secretary of State for Education and Employment, June 1997)

In the past, the lack of evidence that improving school buildings raises achievement may have inhibited school managers from investing in their school infrastructure and weakened the cases of those seeking to reinforce their claims for capital funding.

While some cases of the physical environment affecting the ability to teach and learn appear fairly clear cut (such as not being able to hear the teacher because of bad acoustics), it is a daunting task to isolate a range of physical factors and measure their effect on learning. The need to make the link between school building condition and attainment was noted by Ken Beeton, Head of the School Capital and Buildings Branch of the then Department for Education and Employment, 'If a link can be made, we will be able to focus investment where it will have the maximum effect and, hopefully, justify further additional money' (1999).

Here, we will look first at studies that examine social and organisational variables, and, second, at the literature that looks at causal linkages between the physical environment and educational outcomes.

SOCIAL AND ORGANISATIONAL FACTORS

There is a body of work focused on the management of specific areas of the school, e.g. Hastings's work on seating arrangements and classroom layouts (1995). Some ethnographic accounts have provided insight into the different ways in which gender affects the utilisation of, and movement within space (Gordon and Lahelma, 1996). A number of qualitative studies have looked at the ways in which personal space can have a direct impact on learning. Research carried out by Wiles (1979) examined the importance of educational space in affecting social interaction between students and teachers.

There has been much output on the size and location of schools in the US with the small school movement receiving considerable attention. A review of the research evidence on school size repeatedly found small schools (both elementary and secondary) to be superior to large schools on most measures and equal to them on the rest (Cotton, 1996). One study has shown that the reconfiguration of large urban schools in Chicago into smaller schools is having a positive impact on student performance, school climate, professional collegiality and parent satisfaction (Walsley, 2000).

In Britain class size rather than school size has received research attention. Investigations into the intensity and density of classroom use (e.g. Blatchford and Martin, 1998), have been particularly eagerly received because the reduction of primary school class sizes was one of the government's key objectives during their first term.

ENVIRONMENTAL VARIABLES

There is a considerable amount of literature on the physiological effects of specific environmental variables on the ability to teach and learn. Many of these studies are small scale and focus on isolated variables. Particular factors were not found to be consistently significant across all studies.

However, two major US research reviews (Weinstein 1979; McGuffey 1982) revealed that thermal, visual and acoustic factors and the effect of colour consistently had a direct impact on students' and teachers' ability to concentrate on learning tasks, and that this affected student attainment. The table below brings together the findings from various research studies on factors identified as significant in influencing learning.

Structural factors that influence learning	Cosmetic factors that influence learning
Building age	Interior painting
Windows	Exterior painting
Flooring	Floors swept
Heating	Floors mopped
Air-conditioning	Graffiti
Roof leaks	Furniture
Adjacent facilities	Landscaping
Locker conditions	
Ceiling material	
Equipment	
Lighting	
Colour	
Noise	
Student density m2/student	(adapted from Australian Department of Education, Training and Youth Affairs (DETYA), 1999)
Site acreage	

CAUSAL LINKAGES BETWEEN SCHOOL BUILDINGS AND EDUCATIONAL OUTCOMES

This section discusses existing literature on the relationship between school buildings and educational outcomes. In this context, educational outcomes refer to the direct and indirect influence of the physical environment on achievement as expressed in standard assessment outcomes.

Research in the USA

Various studies carried out in the United States in the 1990s have established a positive relationship between achievement scores and school building condition. The difference between test scores in standard and sub-standard school buildings in these studies is in the range of 5–17 per cent.

A growing number of quantitative studies in the US in the 1990s have attempted to establish a causal relationship between building condition and student attainment levels. Most of these were similar in design and methodology.

A study of the District of Columbia school system by Edwards (1991) used a research instrument that incorporated certain building conditions cited in previous research as having a positive relationship with achievement and behaviour. After controlling for other variables such as a student's socio-economic status, Edwards found that students' standardised achievement scores in school buildings in poor condition were 6 per cent below those in schools in fair condition and 11 per cent below those in schools in excellent condition.

Cash (1993) in a study of rural high schools in Virginia, found that student scores on achievement tests, adjusted for socio-economic status, were up to 5 percentile points lower in buildings with lower quality ratings. Achievement was found to be more directly related to cosmetic factors than to structural ones. Poor achievement was also associated with specific building conditions such as substandard science facilities, air conditioning, locker conditions, classroom furniture, more graffiti and noisy external environments.

Subsequent studies by Earthman *et al.* (1995) and Hines (1996) employed the same basic methodology looking at different school populations and also found a relationship between student achievement scores and environmental factors.

The limitations of this series of studies are discussed alongside those of other quantitative research in more detail below (p. 10). One of the criticisms has been the lack of follow-up research for some of these studies. The majority of studies were carried out by graduate research students who didn't conduct further research after earning their doctorates (Earthman, in Stricherz, 2000). This type of study leaves anomalies in the data unanswered, and does not investigate the potential 'lagged' effect of investing or not investing in school buildings over a longer period of time.

Longitudinal studies

In an attempt to address this, several more longitudinal studies were carried out that allow a more robust analysis over time. Maxwell (1999) completed a study on the effects of school renovation on Syracuse City School students. Third- and sixth-grade student test scores in mathematics and reading were analysed before and after facility upgrades in an 11–12-year period of renovation in several elementary schools. A statistically significant relationship between newer facilities and higher mathematics scores was found. The relationship was found to be strongest amongst sixth-grade students. Reading scores were not significantly correlated with facility condition.

A large-scale study entitled 'Where Children Learn' commissioned by the **Council of Educational Facility Planners, International (CEFPI)**, which examined test scores from years 1996, 1997 and 1998 and data on student characteristics such as racial/ethnic group, attendance, eligibility for free lunches, was collected from 139 Milwaukee schools. Schools were scored on such attributes as the condition of their lighting, general upkeep and water systems. The study found a significant relationship between facility condition and student achievement in two out of the three years examined. Students in the first two years of the study scored 1 to 1.5 points higher on state tests for every 10-point gain in the condition of their school building (Lewis, 2000).

Research in the UK

The only substantial study yet to be completed in the UK found 'some evidence of a positive and statistically significant relationship between capital investment and pupil performance.'

As yet, no equivalent body of research to that in the US exists in the UK. Two recent major studies, one commissioned by the government and the other receiving substantial government funding support will hopefully stimulate further interest in the field. One of these, the **School Works** project, is ongoing and its results have yet to be disseminated. Both projects differ from work carried out in the United States in that they adopt a multi-methods approach, utilising both quantitative and qualitative methodologies.

Building Performance Research Report

In 1999 the Schools Capital and Buildings Branch of the DfES (then the DfEE) commissioned PricewaterhouseCoopers (PwC) to conduct an evaluation of the assumption that investment in school buildings has a positive impact on pupil performance. Undertaking a literature review of 54 studies, and utilising both quantitative and qualitative indicators, the report describes itself as representing 'the first major attempt in the UK to examine empirically the relationship between capital investment in schools and pupil performance' (PricewaterhouseCoopers, 2001).

The evaluation included a quantitative analysis of information on overall capital spend in 1,916 English primary and secondary schools. Just under half of the schools had had

some form of capital expenditure over the period 1993–95. Data on capital spend was taken from various DfEE sources together with OFSTED data on the overall quality of capital stock in each school (adequacy of accommodation was ranked by inspectors on a seven-point scale ranging from 'excellent' to 'very poor'). In addition, data from a range of more qualitative OFSTED indicators were used in the analysis. These included teacher quality, adequacy of general school resources, leadership, school ethos, parental involvement, behaviour and relationships. Pupil performance was represented by Key Stage National Tests (SATs) and GCSE and A level assessments.

Correlational analyses carried out on the data by PwC found evidence to suggest that the schools which had capital expenditure over the period 1993–1995 tended to have higher performance levels at all assessment stages than did those schools that had no capital expenditure during that period. However, the findings were more mixed with respect to variables concerned with the adequacy of accommodation and performance levels. For example, A-level and Key Stage 1 performance was higher for schools with a high quality capital stock but performance at Key Stages, 2, 3 and GCSE was lower. The estimated size of the effect of capital of the correlational analysis was relatively small and often statistically insignificant. However, both the correlational and multivariate analyses (which controlled for factors such as type of school and socio-ecomomic backgrounds of pupils), suggested that capital spending has a positive and statistically significant impact on performance changes at Key Stages 1 and 3. The report does not discuss the possible reasons for this.

Overall, then, PwC found 'some evidence of a positive and statistically significant relationship between capital investment and pupil performance'. The estimated relationship between capital and performance was not found to be 'universally positive nor universally statistically significant'.

The study team went to some lengths to qualify their findings. In particular, it was emphasised that the data used was based on aggregate measures of capital expenditure and was drawn from wide range of sources. It was not designed for the purposes of conducting the research project. The relatively modest capital–performance relationships were thus attributed to some extent to the limitations of the analysis, as opposed to the lack of a strong underlying relationship. Agreeing with previously cited researchers, PwC suggested that a longitudinal study could yield a more significant relationship commenting that 'it may well be that the main impact of capital on performance only becomes evident over the longer term'.

The School Works project

Schools Works, a multi-disciplinary project (discussed in more detail in Chapter 4), has received very substantial government capital with which to refurbish a south London secondary school. The project has developed a series of quantitative and qualitative indicators with which to monitor its progress. These offer a more comprehensive framework than the scope of the variables used in previous studies discussed. The indicators were developed collaboratively together with the New Economics Foundation, through a series of workshops with staff and students, to test the hypothesis that changes to school design can have a positive impact on learning.

Quantitative indicators include cost of vandalism per annum, staff days lost through illness, pupil exclusion data and rates of authorised/unauthorised absence of pupils. The qualitative indicators test mainly indirect factors such as belonging and self-esteem. The indicators include whether staff and pupils feel safe and secure, and the number of pupils present within the first five minutes of lesson time. Both sets of indicators will be tested by the school staff and pupils over the next five years in order to produce 'a composite, longitudinal picture of academic and attitudinal change and well-being associated with the construction process' (from School Works website, 2001). The indicators have been cross-checked with those developed by PwC in the above study and with the OFSTED evaluation schedule.

Limitations of quantitative research

Methodological difficulties in isolating variables, along with the inconclusivity, inconsistency and lack of follow-up of many studies means that findings should be viewed with caution.

Quantitative research overall implies that a relationship exists between school buildings and achievement. However, endemic methodological problems in isolating and controlling all the influences on learning severely limit its usefulness. Much of the research carried out so far has yielded only tentative results with the relationship between school buildings and attainment not always statistically significant. It has often yielded mixed and inconclusive results, both within and across studies. For example, Maxwell (1999) does not adequately account for her finding that mathematics but not reading scores significantly correlate with facility condition; the Where Children Learn Project (2000) fails to discuss reasons why the study only found a significant relationship between facility condition and student achievement in two out of the three years examined.

The problem of identifying significant variables amongst the complex array of direct and indirect influences on learning has been emphasised by research reviews and those involved in the studies. It can be reasonably said that most researchers are wary of drawing firm conclusions about a link between improved student achievement and good school conditions. In a research review, Earthman and Lemasters (1998) comment that 'The difficulty in properly isolating the variables that influence student learning presents some major methodological problems and makes any research effort into this area tenuous at best.' The Council for Educational Facility Planners, International (CEFPI), too, in discussion of the outcomes of their 'Where Children Learn' project assert that 'with the complexity of the learning process and the number of factors that can influence it, it may not be possible to produce a definitive estimate of the effect of facility conditions on student achievement' (CEFPI, 2000).

Prior to the dissemination of the PwC report, Ken Beeton, Head of the School Capital and Buildings Branch of the then Department for Education and Employment who commissioned the research, noted that it would 'be extremely challenging to identify the impact of capital investment alone on the final output of attainment levels' (1999). Moreover, as the PwC study acknowledges, simply adding up total *quantity* of capital spent on school infrastructure does not pick up on the *quality* of this spend; it is not only what is spent on school buildings but how it is spent that has an impact on learning.

Studies finding no evidence of relationship between school buildings and performance

As well as those studies that have looked at school building and performance in isolation, some research has looked at the physical environment alongside many other variables. Two of the best known large-scale studies of this kind found no evidence of a relationship between school building condition and student achievement.

One major US study that looked at school facility construction and maintenance alongside other variables including teacher student ratios and central office administration 'when money matters' concluded that there was no link between spending on school facilities and student achievement. Using a national sample of 14,000 fourth- and eighth-graders, Wenglinsky compared standardised mathematics scores against the amount spent on 'capital outlays' and found that increasing spending would not increase student performance (1997).

Findings of the first major study in the UK into the impact of schools on pupils back in 1979 have often been used as evidence to suggest school buildings are an unimportant factor in student learning and that the physical environment has no bearing on outcomes such as behaviour and academic achievement. Rutter *et al.* compared the progress of over 2,000 pupils in 12 inner-London secondary schools. They assessed why there were differences between schools, and determined how schools influence students' progress through various measures of pupils' behaviour and attainments. Criteria used examined the social organisation of the school in relation to outcome categories of the effects on attendance, student

behaviour, exam success and delinquency. The study asserted that 'differences in outcome between schools were *not* due to such physical factors as the size of the school, the age of the building or the space available'. However, the authors went on to emphasise that 'schools varied greatly in how they responded to the physical conditions available to them ... these variations in the care and decorations of the buildings did prove to be related to outcome'.

Qualitative research on the indirect influences of school space on learning

There is evidence from the UK and the US that the physical setting affects both teacher and student behaviour (such as attendance and concentration) and attitudes (such as motivation and self-esteem). The impact of the physical environment on the behaviour and attitudes of teachers and students has a mediating effect on student achievement.

Though it may be problematic to identify a direct causal relationship between the school environment and educational outcomes through quantitative research, qualitative research on the indirect influences of school buildings on student learning and behaviour is of use in enhancing our understanding of the factors involved. Indirect influences refer to social and emotional factors such as motivation, morale and self-concept that affect behaviour, which in turn is likely to affect performance.

The qualitative analysis carried out for the PwC study discussed above included interviews with head teachers of 27 primary and secondary schools in four local authorities throughout England. Size, location, levels of deprivation and concentrations of ethnic minorities were taken into consideration. Schools that had had significant capital expenditure in the last five years on building works in a range of categories were identified for the sample.

Pupil motivation

The qualitative analysis concluded that a high quality physical environment was seen by head teachers to be a 'key factor in pupil motivation, through the visible sign that their education is valued by the teaching staff and society in general' (PwC, 2001). Head teachers of secondary schools in particular saw an important link between capital investment and pupil motivation. The head teacher of a community secondary school that had been remodelled as part of removing surplus places commented:

> *The school leaked, was draughty, was insecure and vandalized.... Now ... the school is shiny new and carpeted in the classrooms and has modern facilities and equipment. That has helped to create the precondition for teaching quality to make an impact – and it has. I see the work as part of the 'social inclusion' agenda. It gave the pupils visible proof that those in charge feel they are worth supporting and worth providing decent facilities for. It enhanced their view of themselves and their potential.*
>
> (PwC, 2001)

Head teachers in primary schools saw a somewhat weaker link between capital and pupil motivation. This was explained in terms of younger pupils being less affected by their physical environment than by the relationships they establish with their teachers and other adults in the school.

Teacher motivation

The PwC study also judged teacher motivation, for example, through the boost to morale which teachers get from working in an appropriate and high quality physical environment, as having a major impact on pupil performance. The head teacher of a community secondary school commented:

> *There was a considerable effect on teacher morale. The quality of working environment gives strong visual messages. It tells people what you think of them. People believe what they see and experience rather than weasel words. Poor buildings say that you don't have a value in the system.*
>
> (PwC, 2001)

The Corcoran and White (1988) study examined working conditions in 400 interviews with teachers and other school workers in 31 elementary, middle and secondary schools in five USA urban school districts. It concluded that 'physical conditions have direct positive and negative effects on teacher morale, sense of personal safety, feelings of effectiveness in the classroom and on the general learning environment'.

Cooper (1985) conducted research with 70 teachers in 10 primary schools in England asking them through a 'free description questionnaire' to assess the buildings in which they worked and the functions they ascribed to the physical environment in which they taught. He concluded that whether or not physical environments are themselves capable of disabling education, 'Teachers' belief in their capacity to do so could prove self-fulfilling ... [by acting] to lower their morale and motivation so eroding their commitment to teaching'.

In a questionnaire administered over the telephone to 1,050 teachers representing all regions of the USA, when teachers were asked whether they thought well designed classrooms improved learning and achievement, 37 per cent believed classroom design has a 'very strong impact' on student learning and achievement with another 55 per cent believing it had 'a somewhat strong impact' (Beth Schapiro & Associates, 2000).

SUMMARY AND DISCUSSION

There is a need for:

- systematic collection of detailed data on school buildings at a national level for use in large-scale longitudinal research
- more inter-disciplinary and collaborative research between building professionals and educational researchers
- research into the built environment to become a recognised area for the awarding of grants by funding bodies including the government.

A growing body of empirical evidence demonstrates that the quality of the built environment can have a discernible influence on academic achievement and, in particular, on student and teacher behaviour. Research carried out into the relationship of school building condition with achievement has yet to develop a satisfactory methodology and has not fully explained some ambiguity of findings. Such work needs to be underpinned by detailed information on the quantity and quality of capital expenditure on school build projects. Data provided for local authority Asset Management Plans could act as a starting point for the development of such a database.

Research is less likely to establish direct causal between spatial features and educational outcomes than to show how physical conditions indirectly affect pupil outcomes. In particular, the attitudes that teachers and students have towards the built environment and how this impacts on their behaviour can significantly enhance or impede learning.

Rather than seeking a definitive correlation between the built environment and educational outcomes, future research should adopt a more holistic approach to the examination of the factors responsible for student achievement. The physical setting needs to be examined alongside pedagogical, psychological and social variables that act together as a whole to shape the context in which learning takes place. Research is needed into the 'ecology of learning' (Golby and Appleby, 1996), that is the less quantifiable qualities of the built environment and the impact and significance of the school buildings to those functioning within them on a daily basis.

Synthesis of educational and architectural expertise

... we must learn to analyse the best in educational practice and help translate that thinking into learning spaces or environments.

(Taylor, 2001)

Just as designs for new school buildings are often created without reference to changes in education or wider society, changes in pedagogical theory and practice do not adequately

recognise the impact of the physical environment on any new approach. It is vital to integrate educational goals with those of architectural design. There is a need for more work such as that undertaken by Lackney and Moore (1994). They took a 'research based approach to educational facility design', reviewing and interpreting empirical research from a range of different disciplines in the United States and Europe and translating them into workable plans for school facilities.

Taylor calls for 'a system for assembling theories into a coherent and practical tool for restructuring education and educational facilities within the context of community' (2001). This is a call for practical and research-based projects involving partnerships between architects, educationalists, school users and the wider community that engage them in an active, participative relationship with the school buildings. Such projects alongside continuing research into the built environment and learning and behaviour should be recognised as a priority by research bodies and charitable trusts. Government funding should also be forthcoming. The £7.5m awarded to the Schools Works project by the DfES is encouraging, although it could be argued that funding would be more effective if distributed more equitably amongst multiple research projects between schools and design organisations. Chapter 4 further develops the idea of the importance of shared expertise in relation to the built environment of the school and provides examples of partnership projects.

Research-based evidence of the effects of buildings on their users is highly desirable, but it is not required to justify high quality school environments. As Duke points out; 'even if no links between learning facilities could be demonstrated scientifically, there is a moral obligation to assign young people safe and well designed schools' (1998).

4 Participation

Communities and students benefit when the design process becomes a part of curriculum, when architectural programming needs are expressed in terms of student needs, and when students are involved in facilities planning and design.

(Taylor, 2001)

There is a need for:

- developed models of authentic participation costed into the design process from the outset
- adoption of a systematic, participatory approach to changes in school organisation of space and use of accommodation
- development of methodologies and materials to better understand student outlook and concerns
- development of resources that incorporate the use of the built environment into the curriculum at school and national levels
- physical environment and participatory working to be addressed alongside pedagogical and psychological concerns on initial teaching training programmes and as part of continual staff development
- architects to become trained in understanding pedagogical and curricular requirements
- development of structures that ensure the sustained impetus of collaborative projects with design specialists once the project has ended
- a lobby or advocacy group on behalf of school buildings, such as the CEFPI in the USA, or the role Learning through Landscapes plays in school grounds.

Beyond general tidiness and classroom displays, many educators may not be accustomed to thinking about their physical environments as an active medium contributing to learning behaviours, and tend to make a distinction between 'education' and the physical setting in which this takes place.

This chapter argues that active engagement with the environment by school users can enhance the potential of a building in supporting learning. Active engagement by school users should occur:

- at the planning and design stage of new build projects and extensions /adaptations to an existing environment
- on a daily basis through the use of the school building as a tool to enhance teaching and learning.

USER PARTICIPATION IN DESIGN PROJECTS

In recent years interest in the control and use of the built environment has grown. Community urban design projects now recognize that tangible benefits can be gained by involving people in shaping their local surroundings. The community should be actively involved in generating initial ideas and issues, rather than being consulted about a pre-conceived design or agenda. The benefits of authentic participation include the emergence of better decisions and more appropriate solutions through the harnessing of stakeholders' knowledge of their surroundings. Central to the participatory process is the gradual building of consensus and ownership which in turn creates a sense of community and shared aspirations. People feel more attached to an environment they have helped to create; they will therefore manage and maintain it better, reducing the likelihood of vandalism, neglect and costly replacements in the future (Architecture Foundation, 2000; Lackney, 2000).

FreeForm Arts Trust

FreeForm Arts Trust is a national charity which employs architects and artists to work on multi-disciplinary projects involving local people in the urban regeneration process. Expertise is offered in the field of community participation and community architecture and design.

Children's 'voice'

Within the general movement towards collaborative, participatory projects, much literature has addressed the historic neglect of children's 'voice' in decision-making processes. Typologies and models of involvement have been developed to show what is an effective level of participation (e.g. Sheat and Beer, 1994). Much of this literature concerns the involvement of children and young people in the design of the physical spaces in which they live. Programmes such as that initiated by the Children's Society in schools in five London boroughs encourage children to look at aspects of their wider local neighbourhood as well as their school community. The project's starting point was the belief that 'children have a right to be listened to and to participate in decisions that affect their lives' (Children's Society, 1997). In schools, pride in creating, and being listened to, increases pupils' sense of respect for their environment and stimulates a sense of community which in turn creates a sense of well being and enhances potential for learning (OECD, 1990).

The *Guardian*'s **'The School I'd Like'** competition invited children and young people to express their views on the changes in education that affect them. Described as 'a chance for young people themselves to propose changes for the coming century', some 15 000 entries were received. These will contribute to a new archive at Bretton Hall College of the University of Leeds and will be used as a basis for research. Most entrants wanted to change elements of their physical environment before any other.

The literature written about giving pupils 'a voice' has criticised some initiatives for trivialising children's input into the design process, claiming that sometimes participation is little more than tokenism (Sheat and Beer, 1994). There is a danger of 'bandwaggoning' participation by using it as a means to legitimise design proposals and support for projects. Authentic participation does not come cheap; participatory design can increase a designer's workload by 20–40 per cent (Oberdorfer, 1988, in Sheat and Beer, 1994). The financial implications together with the time and effort involved in collaboration can dissuade building designers from becoming involved in participatory projects. However, recognising the time-consuming nature of authentic participation and costing this into a project brief is being increasingly being advocated. **Schools Works** (2001b) argue that user participation produces

a better, more sustainable building and that a building process that costs more in the short-term can save money over the long-term.

Teacher 'voice' in the design process

> *There is a need for a combined effort ... so far there has been little guidance offered to teachers and designers on how their respective areas of expertise might be combined within the design process.*
>
> (Sheat and Beer, 1994)

Teachers, both in their professional role and as daily users of the building, are an invaluable source of knowledge in the design of an effective school environment. Their expertise has not always been utilised, however.

The relative lack of success of the open plan schools built in the 1950s and 1960s as part of the wider open education philosophy was partly due to the lack of consultation with teachers about the new design. There was no dialogue between government, architects and teachers, and consequently teachers were not trained and advised about how to use the new buildings. Some teachers felt alienated and resented the physical structure that seemed to have been imposed on them 'from above', with aesthetics rather than educational function in mind.

The OECD recognised the disillusionment with design and evolved guidelines for teacher contribution to the design of schools. These emphasised that it was not enough for teachers to be involved at the briefing stage in order to define 'user requirements', or to be merely be consulted at the design stage, but rather there should be a 'plurilogue' between all parties, namely architects, decision-makers, technical specialists and users, at all stages of the planning of the building (OECD, 1976).

Makeover at School Project, SENJIT, Institute of Education
One of the services provided to LEAs within the Special Educational Needs Joint Initiative Training (SENJIT) consortium is for an architect experienced in school design to visit the school for a day and produce a brief recommending adaptations. The brief can act as a catalyst to encourage discussion about design needs amongst the various stakeholders in the school.

EXAMPLES OF PARTICIPATORY SCHOOL DESIGN PROJECTS

Collaboration between school users and architects over the design of school buildings is occurring more frequently, although it has been noted that more thought seems to have been given to such involvement outside schools (e.g. wider community regeneration projects), than within (Penrose, Thomas and Greed, 2001). Some examples of projects that involve student and teacher participation are outlined below.

Developing methodologies for pupil participation in design

A major part of a recent interdisciplinary research project was the development of resource materials for interviewing pupils about their experiences of their school environment (Penrose, Thomas and Greed, 2001). One of the aims of this pilot project was 'to develop new methodology which enables access to children's constructs about the design of the school, and in particular to develop methodology which gives access to the ideas of those with disabilities, learning difficulties or behavioural difficulties with a view to enabling their effective participation in design' (ibid.) Semi-structured interview sessions with 13 children and young people of varying ages including some with visual and hearing impairments and behavioural difficulties were carried out. The interviews involved activities such as drawing, identifying good and bad designs, and discussion of visual and aural focus materials asking students to provide accounts of their own experiences in the built environment of the school.

The findings for this pilot study showed that aesthetic rather than functional considerations were likely to be prioritised by students. All interviewees mentioned colour, light, and space as being factors which they would notice in their environment.

MAKING FISH: THE ST JUDE'S FUTURE ENVIRONMENT PROJECT

The Making Fish initiative was a partnership project between architects, landscape artists and a primary school in Glasgow. Making Fish involved a three-year residency for the design professionals in the school during which they undertook a range of projects with the pupils. The residency was funded by a Scottish Arts Council grant lottery award. Making Fish described itself as 'an educationally based investigation with the hope that findings and work could be applied to future changes to the school'. The aim of Making Fish was two-fold:

- to reinforce ideas that environmental design subjects should be an integral part of the school curriculum
- to widen the debate relating to the role of children of in the decision making process that affect their environment.

An initial series of workshops with staff and pupils aimed to introduce the project, highlighting the existing environment of the school and getting a measure of what was wanted and what was achievable. The second series of workshops aimed to broaden experience and develop opinion. Activities included excursions to places of interest around Glasgow and a parallel was developed between the plan of the city and the layout of the school. Four themes were developed: colour studies, 'natural' environment, spatial analysis and design exercises. Pupils undertook work that went on display both inside the school and in the school grounds. The entrance hall of the school was also redecorated by a local artist using designs developed by pupils in workshops.

Workshops with staff and parents developed ideas on school design and safety and using the school as a community resource.

Outcomes

The project was able to demonstrate the rich possibilities of children's participation within the design of a school building. Making Fish describes how the school's esteem in the local community was raised by bringing the school into community life in a very active way through open days and open workshops. Most significantly, a parent group was founded to develop investigations into permanent improvements to the school fabric and to take forward a brief based on pupils' work highlighting which elements of school design they felt were of importance. Making Fish thus saw itself as successfully demonstrating the way in which a dialogue between architects and people can be mutually empowering and can result in raised awareness and understanding.

Problems of conflict and expectation

The project evaluation is careful to describe the difficulties encountered during Making Fish and this is perhaps of most use to other schools.

There was an expectation amongst some adults and children that the presence of the project in the school would produce actual changes to improve conditions. As a result some failed to be convinced of the worth of a purely educational endeavour when there was such a blatant need for physical improvements within the school.

The Making Fish self-evaluation therefore highlighted the importance of

- clarifying the role of staff, pupils and artists
- explaining what the end result of the process might be
- embracing the art of negotiation and compromise.

The Making Fish evaluation also commented that the increased awareness and understanding of school building design would be problematic to sustain once funding for the project ceased and there was no longer a residency at the school. The problem of sustaining momentum once an initiative has been completed and outside advisers leave is endemic to all projects. Structures are needed to continue to support and nourish the enthusiasm and knowledge gained during these periods of collaboration with outside professionals so that the school building continues to be at the heart of all school activities. (See Creese *et al.*, 1997 for a powerful structural model for maintaining school impetus on development.)

SCHOOL WORKS

Schools Works asks 'how we might build, renovate and use school buildings in ways which raise educational achievement and support a culture of lifelong learning in local communities' (2001). The project describes its approach as 'all about participation … developing new parameters in the participatory development of a design brief and in the procurement and design of secondary schools more generally' (website, 2001).

The School Works project chose Kingsdale School in south London, a large 1950s comprehensive which had previously been on special measures, as their partner school with which to try out a 'different approach to school design' As well as the architects, The School Works team includes an educational psychologist, education policy adviser, performance artists, artists, construction manager and engineer. The team worked together with students, staff, parents, governors and the wider community, on a three-month 'participatory process' involving a series of workshops.

Some of the requirements for building and design and cultural change produced by the workshops included:

- peaceful places to study
- the need to recognise pupils' efforts through performance, displays of work, mentoring and counselling
- the need to ensure that decisions on the buildings' use should reflect the diversity of pupils
- effective circulation spaces to promote good behaviour.

(Comely, 2001)

At the time of writing, School Works is involved in detailed design to turn the brief developed in the workshops into reality.

School Works Toolkit

Based on its work with Kingsdale, School Works has produced a 'Toolkit', which has been distributed to secondary schools throughout England. The Toolkit provides step-by-step advice on how to set up a participatory process designed to 'provoke debate, explore the issues and build consensus on a design brief, and which is both educational and fun' (2001).

Together with the RIBA, School Works has also developed a new competition format which is available to schools from the RIBA Competitions office. This will assist schools in appointing architects who will be able to work in a participatory way.

School Works stresses that it aims to forge 'guiding principles' for collaborative design that 'will ensure each school can be the designers of their own creation' (website, 2001). This laudable desire for replicability will perhaps be greeted with rueful derision by schools that don't have £7.5m and access to the wide range of professionals that the School Works partnership school is benefiting from. That said, the Toolkit is highly effective as an aspirational document and a key resource for schools wishing to develop participatory projects concerned with school design or otherwise.

BUILDING AS EDUCATOR – SCHOOL AS TOOL

The users of the building, the staff and pupils ... should be assisted and trained in understanding the possibilities buildings can offer.

(OECD, 1990)

The importance of participation of school users in the design processes has been demonstrated. To maximise the potential of school buildings to be a stimulating resource and an effective learning tool, teachers and students must be involved in their continuing evolutionary processes as well as their creation. It is important to maintain the interaction of its users with the school environment during periods when there are no large-scale adaptations on the horizon. In this way, optimising the use of school buildings can be seen as a process of continual improvement.

OWNERSHIP NOT OCCUPATION

It has been argued that 'appropriation of space' is intrinsic to the well being of those inhabiting it and that a sense of 'ownership' or 'stewardship' of the environment in which pupils study and play is highly desirable.

(OECD, 1990; Taylor, 1998)

Involving pupils in creating and maintaining an attractive physical environment and generally encouraging them and their families to actively participate in school life has been demonstrated to have a positive impact on attendance levels and makes vandalism much less likely to occur (Hallam, 1996).

The physical environment can be seen as a resource to be explored and cultivated for the well being of all school users.

> A case study of Storvret School in Botkyrka, Sweden provides an example of good practice. The idea of the school buildings supporting learning has been fully developed – corridors are furnished with tables and benches made by pupils, new rooms have been made by pupils and staff working together, outside beds have been cultivated for market garden produce.
>
> (OECD, 1990)

LINKING CURRICULUM TO DESIGN

Communities and students benefit when the design process becomes part of curriculum, when architectural programming needs are expressed in terms of student needs, and when students are involved in facilities planning and design. As yet, there have been scarce resources produced that provide the opportunity for the built environment to 'act as a 3 dimensional textbook for teaching concepts across all disciplines'.

(Taylor, 2001)

Examples have been provided of successful collaborative projects that stimulate school users' awareness of their ability to improve the accessibility, adaptability and aesthetic of the school buildings. Participating in such collaborative projects and being involved in decision-making processes regarding school design also provides excellent skills for PSHE and citizenship. They involve making links with the real world beyond the classroom and letting pupils take on a responsible, real task in the community.

The disruption that occurs when new buildings are being constructed can be turned around if the construction process is incorporated into a learning process. School Works plan to monitor the success of such an initiative during the refurbishment of their partnership school. Thus, they recommend using the building process as an opportunity for work

experience placements and industrial visits and advise integrating the construction with the curriculum – for example, reporting on progress in English, creating photographic diaries in art and design, creating signage in design and technology.

Learning through Landscapes

Learning through Landscapes, a charity founded in 1990, aims to heighten the awareness of LEAs, school governors, parents, head teachers and teachers of the potentialities of the school landscape as a valuable asset which can provide a rich and stimulating resource for formal and informal child development. It emphasises the scope school grounds provide for working both within a formal framework in terms of the National Curriculum and the opportunities they can provide for less structured learning.

Learning through Landscapes have produced materials suitable for Key Stages 1 and 2 on how the school grounds can be used to extend children's learning within a number of different curriculum areas including history, English, mathematics, science and personal, social and health education (PSHE).

On an ongoing daily basis too, school buildings can also provide rich opportunities for many areas of the National Curriculum: for instance as a stimulus for creative writing, as a measuring or area exercise in mathematics, and in CDT. As Taylor writes, through interacting with the built environment in this way, students 'learn to look at architecture and design as a source of knowledge and a way to study concepts across all subject matter areas' (2001).

Architecture Workshops

A Cambridge-based organisation, **Architecture Workshops** facilitates a wide range of workshops in schools at all Key Stages. The workshops are cross-curricula. In an Architecture Workshop, visualising, designing, creating, calculating and analysing are presented through practical activities. Pupils enjoy and learn about the real world through 'learning by doing', self-teaching and communicating to others. Example of workshops include a 'Bridges: maths and design' workshop for Key Stage 2 and a 'Pyramid' workshop for Key Stages 1 and 2.

TEACHERS AS PLACE MAKERS

Many teachers find the design of buildings in which they work can often be more of a hindrance than a help. Facilities available to them for respite, communicative or administrative purposes are all too often dire in comparison to those enjoyed by other professionals. Because so many of our schools are at the end of their design life, the original use envisaged for them has changed. Therefore, in spite of the increased use of new technologies, new teaching methods and increased non-teaching responsibilities for teachers, the setting in which these take place has remained static.

It is important that the physical environment supports rather then impairs teaching. The shape and layout of most classrooms still in use today is a seemingly fixed and immutable factor, designed for traditional 'chalk and talk' teaching and learning. Increasingly, a variety of learning methods demand a variety of spaces. Many classrooms therefore depend on the dexterity and imagination of teachers to be adaptable. There is evidence to show that 'teachers may have a real or perceived lack of efficacy over their physical classroom' (Lackney and Jacobs, 1999). In a *Guardian* article Professor Nigel Hastings cites fear of criticism from senior managers or OFSTED for changing their classroom formations (January 2001).

Architecture Education Network
The Architecture Education Network intends to encourage, enable and facilitate the teaching of the subject of architecture and the built environment as part of the National Curriculum and out-of-school activities. They have a website providing practical information, details of events and resource materials for teachers.

Training in space and pedagogy

There is clearly a need for teachers to become empowered as 'environmentally competent "placemakers"' (Lackney and Jacobs 1999) to maximise the use of classroom space. This proficiency needs to be extended to space management of other areas of the school: the space available to them for leisure, storage or administrative purposes and general public spaces such as corridors.

Having limited resources in which to manipulate the physical dimension of the classroom need not restrict the effectiveness and the variety of teaching methods used. Research has shown that the most successful teachers make creative use of the resources at hand to support their curricular objectives. Effective classroom organisation of existing space may well have more impact than the building itself (Follows, 2000). The success with which school buildings work, then, is as much a measure of how well the users employ the building as a resource as the result of the design itself.

A recent research project carried out by Melanie Evans at the University of Brighton Department of Architecture used three-dimensional models to aid consultation during the design process of a new classroom in a school site in east London. Teachers were challenged to respond at each stage, making informed comments, not just about functional issues, but also on design and aesthetic criteria. As well as understanding and feeling part of the design process, teachers found that the exercise assisted their own spatial knowledge, enabling them to make better use of existing classroom spaces.
(Dudek, 2000)

Teacher training and staff development

Various research findings have pointed to the fact that the physical aspect of classroom management and management of the school as a whole is often not made explicit in teacher training and professional development (Dudek, 2000; Follows, 2000; Horne, 1998; Lackney and Jacobs, 1999). More opportunities need to be created to educate teachers about the design and use of the environment. Correspondingly, as noted in the previous section, architects often have little conception of the complexities surrounding the role of the classroom teacher. They need to be provided with knowledge of learning processes so that the functional potential of the built environment to enhance education can be maximised.

The Council of Educational Facility Planners, International (CEFPI)
The CEFPI is a not-for-profit professional organisation whose members include architects, planners, facility maintenance and operations professionals, teachers, and government agency representatives. It has some 2,100 members in seven regions (six in North America). The CEFPI has three key strategic areas on which it focuses:

- advocacy and education of the general public on the efficacy of school design and student outcomes
- training and professional development of members and others through programmes promoting best practice in school planning
- research and dissemination of information regarding the linkage between the educational facility, its design and student success.

SUMMARY

In the UK today, many educators occupy environments they are unable to exploit to the fullest. Many children and young people, too, spend much of their time in drab and hindering environments that they learn to 'tune out' of rather than develop an awareness and a sense of belonging. Foresight, inclusion and planning are needed to combat this. Increasingly, resources and methodologies are being developed that can assist in developing the authentic participation of students and teachers in decisions concerning the design of their school on an ongoing basis.

5 Opening up the school

Only by becoming truly community orientated ... will funding flow in to rehabilitate the current run down secondary stock in the UK.

(Dudek, 2000)

When opening up school buildings for wider use, there is a need for:

- greater emphasis on planning of educational facilities and regular auditing of space to see whether it can be used more intensively
- space to be flexible and adaptable so that it can be used for a variety of purposes
- clear sign posting and way finding routes to different areas of the school buildings and facilities
- financial and planning considerations to be taken into account
- security risks to be considered.

School premises and equipment represent a substantial investment of capital expenditure. They are historically under-utilised, used only during school hours and closed for much of the holidays. A survey of European schools estimated that school buildings remain closed an average of 150–200 days a year (OECD, 1988). The present government is encouraging schools to open their buildings during the school day and beyond to a range of users. They are keen to promote the community use of schools. The Schools Standard and Framework Act 1998 specifically requires governing bodies to have regard to the desirability of school premises being made available for community use (DfEE, 1999).

ECONOMICS

It makes obvious economic sense to optimise the return from educational buildings and facilities. However, a number of issues must be taken into consideration when doing this. Additional running costs are likely to be considerable. The more schools open up to other users, the more complex and difficult become the problems of financing. There are opportunities for income generation in certain fields of community use and additional income can be used to enhance a school's core operations (DfEE, 1998). There have been concerns however that too business-orientated an approach to opening up the school for wider community use might detract from its primary purpose of educating pupils (OECD, 1996).

Sources of capital funding

The largest source of funding for capital is the Local Education Authority and capital grants direct from government. The creation in 1998 of the New Opportunities Fund (NOF), a distribution body using National Lottery money, provides an alternative source of funding for out-of-school learning activities and childcare. In order to be eligible for NOF funding, applications from schools are required to offer at least 40 hours per week community access to school premises.

Public–private partnerships are also being explored by the government as a way in which to fund 'dual use' schemes. This may involve a private sector contractor constructing a facility such as a sports hall, tennis centre or swimming pool, to which the school has access for an agreed period of time each day. The contractor is free to generate income for the rest of the time including weekends and holidays.

Depending on the sort of development envisaged, schools might also approach:

- the Arts Council of England and the regional arts boards
- Sport England
- voluntary sector organisations
- local or national charitable foundations
- community associations
- parish and district councils
- local businesses.

(DfEE, 1999)

DURING SCHOOL HOURS

Schools are opening up more during the day for a range of peripatetic professionals. Educational psychologists, speech and language therapists, mentors, governors and parents/carers all visit pupils or staff more frequently than previously.

The limited storage, consultation and administrative space experienced by teachers impacts even more on professionals visiting the school. When many older schools were designed, there were few outside professionals visiting school grounds so no space was provided for them. Having no space for private consultation or administration and no storage space for records can affect productivity and raises issues of confidentiality. Rooms that can allow for a variety of different activities and group sizes are highly desirable for peripatetic professionals and regular teachers alike. Such space can also be used to accommodate a range of visitors holding meetings.

In addition, Lackney recommends the creation of a 'parent information center to act as an interface between the school and the community'. This can serve to 'help interested parents learn more about the school, act as a public relations office and act as a home base for parents within the school' (2000).

Wider community use of the school

Opening up the school to the wider community is not a new initiative; there are examples of 'community colleges' in Cambridgeshire that date from the 1930s. Partnership between schools, surrounding community agencies and other public agencies are becoming increasingly prevalent but are still not widespread.

Why increase community use?

- Links with parents and local community organisations help schools to raise pupils' motivation, expectations and achievement, which in turn leads to higher standards and improved behaviour.
- In many locations, the school is the main place that can provide the local community with sports and other facilities. Using the school as a centre for adult learning, childcare facilities and meetings help regenerate and strengthen communities.
- Increased use of school premises can lead to improved security for the school site and reductions in graffiti and vandalism in the surrounding area.
- Links with the community reinforce the fact that all education relates to the wider community and the world of work and professional practice.

(DfEE, 1999)

Literature from the United States (e.g. Lackney, 2000) cites the benefits of the provision of a public assembly space to act as a community forum connecting the school and the community. Dudek provides examples of schools that use their assembly halls effectively as such a space for 'the community in school and the school in the community'. He cites the example of the assembly hall of Glastonbury First School, which is on a different level from the rest of the teaching space. This spatial distinction signifies its location 'between the school and community'. During the week it provides flexible space for assembly, sport and music activities and it can still be used at weekends when the rest of the school is closed off (2000).

It is envisaged that in the future schools will adapted to accommodate adult education and act as multi-agency centres for social, health and educational advice. This will be discussed in more detail in Chapter 7.

OUT OF SCHOOL HOURS

Out of school hours uses encompasses two broad categories of activities: activities organised for the benefit of the schools' own pupils such as study support activities (e.g. home work clubs, music practice, chess clubs), and those which are run by outside groups for the wider community who rent or lease part of the school premises. These include activities such as childcare, sport, performing arts, and social events.

The Trojans Scheme

The Trojans Scheme, an educational charity set up in 1995, runs after-school clubs and holiday schemes at 14 south London primary schools. The schools permit the scheme to use the buildings and fixed resources at no charge. Trojans acts as a community catalyst, providing advice and guidance to PTAs and school governors on how to create clubs. It also advises schools on how to access funding to improve school premises and playgrounds. An after-school club means that the premises are open a further 25 per cent of the day so they have community use. Trojan clubs, which mostly operate in areas where there is social deprivation, can therefore apply for government funding, from the New Opportunities Fund and the Single Regeneration Budget, in addition to non-governmental trusts and grants.

Organisational design issues

There are a number of organisational design issues that become increasingly important when the use of building is expanded or intensified. Maximising the flexibility of the space – that is, arriving at the minimum conditions to make the co-use of the school as easy as possible – is highly desirable. Schools should have the capacity to adjust quickly to frequent low magnitude changes in the demands put on the buildings (OECD, 1988).

There are often problems with multi-access when schools are not designed with this intent. Access to and movement within the premises is important. Limiting access to certain areas simplifies things, and also reduces security risks. It is important that way-finding and signage are clear and accurate, in particular clear signposting to and within and away from the reception area.

The role of school premises in providing a social focus implies that the school needs to be a flexible and responsive structure which is 'open' both functionally and symbolically (Dudek, 2000). This inevitably has practical implications, particularly regarding issues of security. In addition, the move towards a more open school must be handled sensitively as some staff and pupils may feel that they are losing 'ownership' of the school.

6 School building design and inclusion of students with special educational needs and disabilities

> *... asking questions about the physical design needs of pupils with SEN and disabilities is not separate from but an extension of a process of understanding how to enhance the lives of all pupils who study, rest and play at mainstream schools. It is difficult to overstate the importance of this point.*
>
> (DfEE, 2001)

Designing inclusive schools:

- is a process
- is as much to do with the culture and ethos of the school as it is with issues of physical access
- needs to take account of diverse and potentially conflicting needs
- improves facilities for all those using school buildings.

CONTEXT

One of the most important educational issues promoted by the present government is that of inclusive educational practice. Underscoring policy debates is the affirmation that children with severe physical, sensory, intellectual, emotional or behavioural difficulties should be offered the choice of enrolling in mainstream schools 'unless there are compelling reasons to do otherwise' (DfEE, 1997).

Policy

Since the publication of the Warnock Report (DES, 1978) government policy has encouraged the integration of pupils with special needs into mainstream education wherever possible. The accommodation implications of this policy received little attention, however, until the late 1980s and early 1990s. The introduction of the National Curriculum in 1989 prompted concern about the entitlements of pupils with special educational needs (SEN). This concern was reinforced in 1994 by the introduction of the Code of Practice on the Identification and Assessment of SEN. Neither spoke about school design, but both set out requirements that implied space, resources or staffing and raised expectations of practitioners, parents and HM Inspectors. In addition, the newly introduced OFSTED reports began to highlight unsatisfactory aspects of premises for students with SEN (Bishop, 2001).

The late 1990s saw SEN and disabilities gain a heightened political profile and increased capital funding. The extension of the Disability Discrimination Act to include the SEN and Disability Rights in Education Bill, reinforced by the Human Rights Act (2000) is in progress. This requires Local Authorities to plan strategically and make progress in increasing the physical accessibility to school premises and the curriculum. In addition, the introduction of the **Schools Access Initiative (SAI)** to support physical adaptations to learning environments offered a significant increase in funding for certain projects.

The Schools Access Initiative

Set up in 1995, the Schools Access Initiative (SAI) provides funding for mainstream schools to improve access to disabled children. The Initiative is allocated to each LEA on the basis of pupil numbers. It promotes a broad notion of access, which includes physical access to buildings and the acoustic environment and movement around buildings and equipment that facilitates access to the national curriculum. Ramps and handrails, sound proofing, specialist lighting, IT and soft play equipment are examples of sorts of projects funded through the Initiative. The SAI budget has been increased significantly from £30m last year to £50m this year. The Government has announced that a further £70m will be available in 2002–3 and £100m in 2003–4.

Guidance

In 1984 the Architects and Building Branch of the then DES published *Building Bulletin (BB) 61: Designing for Children with Special Educational Needs: ordinary schools*. This gave guidance and advice and provided plans covering room layout, storage and other space and resource requirements for a wide range of SEN and disabilities, although it did not address provision for more severe and complex needs. *BB 91: Access for Disabled People to School Buildings* (1999) outlined the basic features of a school that are necessary for unhindered use for those with disabilities. This explored duties in relation to employing staff, providing non-educational facilities and gave technical recommendations on issues such as the gradient of external routes, internal changes of level and the provision of accessible WCs.

DESIGN AND THE INCLUSIVE PROCESS

The current thrust towards inclusion of all pupils with special educational needs and disabilities offers a major challenge to school managers, local authorities and designers. The role of design has a key role to play in moving towards inclusion.

The recently published *Building Bulletin 94: Inclusive School Design*, signalled a change in philosophy (DfEE, 2001). Its stated aim is to provide design guidance and practical recommendations to help mainstream schools become more inclusive in the ways they are designed and managed. There is a shift in emphasis in the document away from the mechanics of accessible design to concerns with creating the desired inclusive school ethos and culture.

Inclusive design takes place when a commitment towards educational practices and equal opportunities permeates the culture of the school. This is illustrated in a quote from the Head teacher of George's Green School in London:

> *Adapting to special educational needs is not about the building; it's about the culture of the school, a willingness to be inclusive. It would be a cop-out to say we couldn't have a child with a disability because of the lifts – the barriers are more in the mind.*
>
> (quoted in Brown, 2001)

Thinking about inclusion and designing for students with SEN and disabilities will usually yield benefits for a much wider community of pupils, school staff, parents and other children and adults seeking access to resources and courses provided on the school site (DfEE, 2001). Thus, provision of adequate space and storage facilities and optimising the visual, acoustic, temperate and way-finding aspects of a school improve the environment for all users.

Developing attitudes towards inclusion

Case studies that demonstrate the benefit of inclusive practices to the whole school community include these features:

- A shift in attitude towards pupils with special educational needs and disabilities that encourages those involved to take a positive approach to meeting the physical design needs of all pupils.
- Positive changes to pupil behaviour that arose from improvements to the layout and internal design of shared areas such as corridors, cloakrooms and dining halls.
- Improvements to acoustic conditions that helped pupils with hearing impairments, as well as those with temporary hearing difficulties caused by ear infections. All pupils were better able to hear adults and each other.
- Enrichment of the school grounds through the creation of better boundaries between different activities and a broader range of spaces for pupils to enjoy.
- The creation or adaptation of existing spaces to provide extra facilities such as small group rooms, storage space and laundries.

(adapted from DfEE, 2001

Diverse and conflicting needs

Planning for inclusion raises complex issues of organisation, timing and resourcing. The availability (or not) of suitable accommodation influences all of these. As with all pupils, the design needs of those with SEN and disabilities need to take into account access to the National Curriculum, social inclusion and welfare and health and safety arrangements.

(Bishop, 2001)

When designing for inclusion, there needs to be an awareness that there may be potential conflicts between the different physical design needs of pupils. For example, a pupil with limited mobility may require a room temperature that is uncomfortable for more physically active pupils. There is a need for anticipatory planning to minimise such conflicts and the development of flexible design solutions that allow for choice and control. School managers need to be encouraged to indulge in creative problem solving within resourcing constraints and to recognise that the process of inclusion means optimum rather than ideal design solutions (DfEE, 2001). Moving towards inclusion means that 'local opportunities need to be seized, compromises found and incremental approaches adopted' (Bishop, 2001).

Undesirable aspects of mainstream school buildings

Just as addressing the design needs of students with SEN and disabilities can benefit all students, undesirable aspects of mainstream buildings create heightened problems for some pupils with SEN and disabilities.

Problems of lack of space and overcrowding can have a disproportionate effect on some of those with special needs and disabilities. Confining large groups in cramped spaces increases the potential for violent behaviour; this risk is considerably heightened for pupils with emotional and behavioural difficulties (EBD) (Cole *et al.*, 1998). Noisy interaction in such places can cause anxiety for those with autistic spectrum disorders. In addition, the negotiation of overcrowded corridors, recognised as one of the main sites where bullying takes place within schools (Rigby, 1996), can be particularly hazardous for those with mobility impairments.

Lack of storage space can affect users of mobility aids and other specialist equipment. Space for storage of pupils' personal belongings has presented schools (particularly secondary schools) with an ongoing problem. It is a psychological problem as well as a practical one: lack of personal 'territory' can induce anomie and low self-esteem in pupils. Pupils with

EBD are often particularly attached to outdoor clothing and lack of secure provision in which to place personal effects means boundaries between social and out-of-school activities is less clear and may distract pupils from the task at hand (Visser, 2001; Cole *et al.*, 1998).

Pupils with special needs and disabilities are more likely to require the attention of representatives of various support agencies, e.g. visiting social workers, educational psychologists, physiotherapists, speech and language and occupational therapists. As detailed in the previous section, rooms are needed to accommodate such visiting professionals. There is also a need for provision of administrative space for the SEN co-ordinator since the introduction of the Code of Practice. The facility of a 'quiet' room where pupils can go to calm down is particularly important for those with EBD (Visser, 2001).

7 The future of school building design

If schools do not undergo radical reform, they will simply cease to exist as the primary source for 'education'.

(Nair, 2000)

- Wider societal trends as well as educational reforms will increasingly have implications for school buildings.
- Procurement methods and capital funding in England are undergoing significant changes which will alter the way in which school building projects are carried out.
- Sustainability factors will be increasingly taken into consideration when planning design and building of schools.
- Information and communication technology will affect where, how and what learning takes place in schools and beyond. While some commentators are signalling that increased use of virtual learning environments (VLEs) will end the endurance of the traditional classroom as the main space for learning, its survival in the short term seems secure.
- Schools need to adapt in order to become 'neighbourhood learning centres' used by the wider community.
- Merely re-furbishing existing stock or creating new buildings in 'old' ways will severely limit the ability of the education system to effectively provide for wider societal changes.
- Most changes anticipated to occur within education that will impact on school buildings in the near future, e.g. opening up the school to community use, and opening up education to include work-based and virtual learning, have been attempted previously. It is important to recognise this and learn the lessons that previous research into these initiatives can provide.

CONTEXT

Political, social and economic transformations in education inevitably impact on school building design. This can be a slow process: many schools currently make do with outdated buildings designed for different pedagogical practice and curriculum. Until now no nationwide school building or refurbishment effort has occurred since the mid-1970s. The number of architects involved in designing schools is now rising – a workload survey by the RIBA Journal from the third quarter of 2000 showed the value of education commissions at its highest level in five years (2000). While this is encouraging, the inertia of the last 30 years means that a sustained effort is needed to equip the education system with the buildings and resources necessary to enable it to function effectively in the longer term.

Alongside the current drives towards inclusion and community use of schools, and changes occurring in the 14–19 curriculum, commentators suggest that wider social changes will have a profound impact on the skills required for the twenty-first century workforce. The increase in new technologies and a move towards a knowledge-based economy will result in a paradigm shift in when and where and how we learn. This will impact on secondary schools in particular over the next 20 years.

Some see a move towards project-based rather than subject-based learning and emphasise desirable educational goals such as independent thinking, the ability to apply knowledge and the need to nurture multiple intelligences (Nair, 2000). The Key Stage 3 curriculum strategy embodies aspects of this, such as the development of thinking skills, while working within a traditional subject structure. The table below predicts some of the key differences in the way learning will increasingly take place.

Traditional learning environments	**New learning environments**
Teacher-centred instruction	Student-centred learning
Single sense stimulation	Multi-sensory stimulation
Single path progression	Multi-path progression
Single media	Multimedia
Isolated work	Collaborative work
Information delivery	Information exchange
Passive learning	Active/exploratory/inquiry-based learning
Factual, knowledge-based	Critical thinking and informed decision making
Reactive response	Critical thinking and informed decision making
Isolated, artificial context	Proactive/planned action
	Authentic, real world context
	(ISTE data reprinted with permission from National Educational Technology Standards for Students (June 1998) in Nair, 2000)

This stark juxtaposition of 'traditional' and 'new' learning environments must be viewed with caution. It could be argued that 'traditional' learning environments have always incorporated elements of those characteristics defined by Nair as 'new' and that to contrast such items implies a false dichotomy. It seems inevitable that schools of the present and the future need elements from both lists. Such a table also implies the process of change as a smooth transition from one pedagogy to another. It might be more useful to recognise the above categories as a 'tension grid' demonstrating the complexity of the decisions involved.

LEARNING 'BEYOND THE CLASSROOM'

Changes in technology, values and the media have allowed knowledge to break out of the institutions which contained it in the past. Some commentators argue that education must now do the same. The think tank, Demos, envisages the next stage of educational reform is to 'de-school' society. They argue that learning needs to become increasingly 'active' and 'community-based', that is, taking place in the contexts where knowledge is actually applied, in workplaces, families and communities as well as schools and colleges (Bentley, 2000).

Many of the changes Demos advocate would impact significantly on school buildings. In particular, the evolution of schools into 'neighbourhood learning centres', welcoming learners of all ages and providing social, health and careers services alongside a range of educational programmes (ibid.). This idea further develops current initiatives to 'open up the school' as discussed in Chapter 5.

INFORMATION AND COMMUNICATIONS TECHNOLOGY

There is much debate about the level of impact that technology will have on teaching and learning and whether changes will occur in a stages or more rapidly. It is generally agreed, however, that at some point in the coming decades, computing will become ubiquitous, with each student having access to a laptop, and that this will take place via wireless networking.

Some commentators (e.g. Waldron, in Dudek, 2000) argue that the role of the teacher will be changed beyond recognition and the need for teachers at secondary level particularly will be substantially reduced. It is evident that the advent of virtual learning environments, including email, video-conferencing and other forms of electronic communication will not require the student and teacher to be physically present at the same location. Teachers may well take on a more facilitative role, but few commentators predict that they will be dispensed with altogether. The Open University, having developed a pedagogy of distance and flexible learning since 1971, maintains contact time between students and teachers and students and students.

Technological communication, then, will enable learning to be extended beyond the school and into the outside community. People will have access to both virtual school resources and actual school facilities to consolidate their learning. If schools are to be venues for remote demonstrations, e.g. science lessons, classrooms need to be adapted to incorporate technology in order to film this.

It is important to recognise that the ideas of opening up and fragmenting schooling both into the work place and through virtual learning concepts have been with us for some time. Ivan Illich wrote 'Deschooling Society' 30 years ago and, as previously mentioned, Cambridgeshire embraced neighbourhood learning centres in the guise of Village Colleges in the 1930s. Again, caution must be exercised against one-dimensional views of progress. There is a naivety in some of the literature about technology and its all-embracing benefits. The way forward needs to address ways in which it can provide against creating pockets of privilege and ensure that equal opportunities are maintained.

PROCUREMENT

Increasingly, the government encouragement economies of the marketplace are dictating new approaches to the procurement of new buildings.

Strategies to bring about new projects in England will increasingly rely on partnerships with private developers, or in the case of some secondary and specialist schools, commercial organisations. Some commentators are expressing misgivings about such future developments; 'frequently such partnerships create an architecture which is second rate and hardly comparable to the standards achieved by experienced local authority architect's departments' (Dudek, 2000).

Robin Bishop, former Chief Architect at the School Building Design Unit, DfES predicts that by far the greatest demand of architects working in the primary and secondary area in the coming decade will be to adapt and refurbish the existing school stock rather than create new build (cited in Dudek, 2001). Currently two-thirds of all education work reported by architects concentrates on refurbishment, reflecting the fact that many schools have not been substantially repaired since they were built post-1945 (RIBA, 2000).

Certainly minimal intervention (e.g. a well designed entrance, steps taken towards inclusion) can have a marked effect in enhancing the overall quality of the school building. But there are some instances, particularly in relation to new technologies, where an incremental approach could actually create further difficulties in the future. For example, the creation of an ICT 'suite' rather than developing computing in an integrated way throughout class bases. Piecemeal strategies for upgrading the conditions of parts of buildings are unlikely in the long term to be as effective as more radical approaches.

It is important for current and future design projects to steer a middle path between revamping and rebuilding school buildings and work towards a *reconfigured* school model within budgetary constraints. Schools need to develop their own asset management plans so that change occurs within a focused and holistic long-term strategy.

ENVIRONMENT

The quest to build environmentally sound new schools and to find ways of upgrading existing educational buildings is one of the most important aspects of the school designer's remit.

(Dudek, 2000)

Alongside changes in the design process to do with methods of procurement and funding, environmental issues will have an important role to play in considerations of any school building projects. Increasing energy efficiency and sustainable construction will be important issues which will have implications for the choice of site, selection of materials and the method of construction of any new-build schools.

Schools of the Future Project

The Schools of the Future Project at the School Building and Design unit, Department for Education and Skills has produced guidance on the accommodation needs of the next 25 years of education. This includes discussion on the impact of a number of educational initiatives such as:

- inclusion
- new ways of learning and the impact of ICT
- the school as a community resource
- curriculum changes.

The guidance is part of the Building Bulletin series published by the DfES.

NEED FOR FLEXIBILITY AND ADAPTABILITY

The exploitation of new technological resources alongside pedagogical and curriculum developments such as team-teaching, non-chronological grouping and inter-disciplinary curricula, will call for more flexibility in classroom shapes and sizes including the use of temporary partitions, moveable walls etc. The 'one size fits all' classroom dominant in schools today will cease to exist.

Some commentators have argued that designing schools without recognising the shifting boundaries of ways in which we learn, and the subsequent need for flexible and adaptable spaces for multi-purpose building use, means new school buildings could be in danger of becoming 'obsolete' before they even open (Nair, 2000).

As the previous sections demonstrate, it is vital that architects and educators take a long-term and holistic view when planning. Even when projects allow for expansion of technology or changes in pedagogy, these are often just superimposed on already existing structures, thus severely limiting their effectiveness. As Whitty *et al.* state, 'What may seem to be technological advances with radical potential are often accommodated to prevailing modes of educational practice, especially when utilised in conventional classroom environments (1993). Design needs to be carried out within limits that can be maintained by future generations whilst simultaneously allowing for 'what we do not yet know' (Bingler, 2000).

CREATIVITY AND THE LEARNING ENVIRONMENT

Nair argues that one way to approaching the design of a twenty-first century school is to see it as designing for 'improvisational theater' where the space could become a stage for individual, small group or large group learning: 'The idea is that occupants define the space and the activities within the space define its purpose'(ibid.).

As well as a need for creative design of future schools, these buildings also need to support the creativity that new ways of learning will encourage. Burnett states that in order to

'design for creativity. ... we need to become conscious of our 'spatial' requirements and communicate them vociferously' (2000).

SUMMARY OF DESIGN PRINCIPLES FOR BUILDING EDUCATION ENVIRONMENT

- Accelerate and develop longitudinal research on the impact of the physical environment on student achievement and behaviour.
- Use and develop a planning and design process that involves educators, parents, students and community stakeholders.
- Maximise the physical environment's impact on learning through using school buildings and grounds as 'three dimensional textbooks'.
- Think of the 'school as community' serving as a centre of lifelong learning and training and serving leisure, recreation and health requirements.
- Create flexible designs and adaptable systems.
- Carry out on-going evaluation of accommodation needs with a comprehensive audit every five years.
- Plan for the inclusion of all those who use the buildings including those students and others with special educational needs and disabilities.
- Recognise the paradigm shift that technology represents and plan for rapid expansion of its use rather than superimposing it on existing educational practice and resources.

8 Useful organisations

Architecture Education Network
Website: www.architecturelink.org.uk

Architecture Foundation
60 Bastwick Street
London
EC1V 3TN
Tel: 020 7253 3334
Email: mail@architecturefoundation.org.uk
Website: www.architecturefoundation.org

Architecture Workshops
PO Box 217
Cambridge
CB4 1EA
Tel: 01223 365378
Email: elaine.frost@ntlworld.com
Website: www.awa.ndo.co.uk

Dominic Cullinan, CABAL Architects
Springbok Works
Bradbury Mews
Bradbury Street
London
N16 8JW
Tel: 020 7923 7100
Fax: 020 7923 4058
Email: cabal.1@virgin.net

Centre for Accessible Environments
Nutmeg House
60 Gainsford Street
London
SE1 2NY
Tel: 020 7357 8182
Email: cae@globalnet.co.uk
Website: www.cae.org.uk

Council for Educational Facility Planners, International
The School Building Association
Website: http://www.cefpi.org

Design Council
Website: www.design-council.org.uk

Design Share
Website: www.designshare.com

FreeForm Arts Trust
57 Dalston Lane
London
E8 2NG
Tel: 020 7249 3394
Fax: 020 7249 8499
Website: www.freeform.org.uk

The Guardian 'The school I'd like' competition
Catherine Burke
Email: cburke@bretton.ac.uk

Learning through Landscapes
3rd floor, Southside Offices
The Law Courts
Winchester
SO23 9DL
Tel: 01962 846 258
Fax: 01962 869 099
Website: www.ltl.org.uk

Making Fish: The St Jude's Future Environment Project
Headteacher: A. Burns
Tel: 0141 771 2055
Architect: Peter Brown, NB Architects
Tel: 0131 339 0813

Makeover at School Project
SENJIT
Institute of Education, University of London
20 Bedford Way
London
WC1H 0AL
Tel: 020 7612 6273/4
Website: www.ioe.ac.uk/senjit

National Healthy Schools Standard
Website: www.wiredforhealth.gov.uk

Programme on Educational Buildings, OECD
Head of Programme: Richard Yelland
Email: richard.yelland.oecd.org
Website: www.oecd.org/els/education/peb

Schools Access Initiative
Schools should contact their LEAs for details of eligibility for funding.
Any other enquiries to:
Susan Humphreys
Department for Education and Skills
Tel: 0207 925 5603

Schools Building and Design Unit
(formerly Architects and Building Branch)
Department for Education and Skills
Caxton House
6–12 Tothill Street
London
SW1H 9NA
Enquiries: Nicola Williamson,
Tel: 020 7273 6023
Email: nicola.williamson@dfes.gov.uk
Website: www.dfes.gov.uk/schbldgs

School Works
The Mezzanine – south
Elizabeth House
39 York Road
London SE1 7NQ
Tel: 020 7401 5333
Email@school.works.org
Website: www.school-works.org.uk

The Trojans Scheme
Jackie Nunns
Director
c/o Development Office
The Annexe
Stockwell Primary School
Burgoyne Road
London SW9 9TS
Tel: 020 7326 1962

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